IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

INVENTORS:	Mao, et al.	
APPLICATION NO.	10/010,719	Confirmation No. 2723
FILED:	November 8, 2001	Examiner: Schnurr, J.
CASE NO.	TVW/APP32US	Group Art Unit: 2623
TITLE:	VIDEO ON DEMAND GATEWAY	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION UNDER 37 C.F.R. §1.131

1.   This declaration is to establish that the date of invention for the above-identified application is prior to August 3, 2001, which is the effective date of Pub. No. US2003/0028889. This patent application was cited as prior art under 35 U.S.C. §102(e) by the examiner.

2   I am a co-inventor of the subject matter recited in Claims 1-5, 11, 13, 14, 18-24 and 31-42, currently pending in the above-identified patent application.

3   Prior to Aug 3, 2001, I conceived of the invention as set forth in the above-identified claims in this country as evidence by the following:

   a. Prior to May 3, 2001, I participated in the preparation of an invention disclosure entitled "VOD Gateway System Architecture." A copy of that disclosure is attached herewith as Exhibit A. This disclosure describes a system and method for integrating VOD services from disparate VOD systems to provide a unified system having a single, generic protocol as set forth in the claims.

   b. On May 3, 2001, I transmitted the invention disclosure of Exhibit A to our patent attorney, Allan Jacobson, who diligently prepared the above-identified patent

Applicant: Mao, et al.
Application No. 10/010,719
Page 2

application based on the disclosure. A copy of my email transmitting the invention

disclosure (as received by Mr. Jacobson) is attached herewith as Exhibit B.

3.   Prior to August 3, 2001, the invention was reduced to practice as the Liberate VOD

Gateway™ middleware product. Among other installations, the product was integrated with an

interactive TV and VOD offering from Concurrent Computer Corporation, a leading provider of

Video-On-Demand (VOD) products as evidenced in the April 11 2001 press release attached as

Exhibit C. As set forth in the article:

> Concurrent and Liberate integrated their products using the Liberate VOD
> Gateway(TM) technology, which is available immediately. The Liberate VOD
> Gateway technology provides complete integration of partner VOD solutions on
> the server side of the architecture, which speeds and simplifies both deployment
> and management for network operators. Essentially, the VOD Gateway solution
> allows the Liberate Connect(TM) server software to offer a plug-in environment
> for partner VOD applications.

Therefore, this press release acknowledges that the VOD Gateway had not only been conceived,

but also had been installed and was operating with the Concurrent product.

4.   Additionally, I understand that our attorney, Allan Jacobson, worked diligently from

August 3, 2001 to November 8, 2001 to prepare and file the application, thereby constructively

reducing the invention to practice as well.

5.   As the person signing below:

I hereby declare that all statements made herein of my own knowledge are true and that

all statements made on information and belief are believed to be true; and further that these

Applicant: Mao, et al.
Application No. 10/010,719
Page 3

statements were made with the knowledge that willful false statements and the like so made are

punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States

Code, and that such willful statements may jeopardize the validity of the application or any

patent issued thereon.

Co-inventor: Weidong Mao

Signature:

Residence: 23 Zaitz Farm Rd.
West Windsor NJ 08550

Citizenship: United States of America

EXHIBIT A

VOD Gateway System Architecture

1. Introduction

1.1 Scope

Liberate VOD Gateway 1.0 provides an end to end infrastructure for integrating the Liberate TV Platform (standard) server and client suites with various VOD components such as VOD streaming server, VOD business management system and billing, and VOD asset management system. The VOD Gateway provides the following advantages:

- Adherence to open standard (DSM-CC, RTSP)
- Integration with multiple VOD vendors
- Customization of application based on open Internet standard
- Provide robust scalability and reliability
- Allow single client for multiple VOD vendors
- Seamless integration with Liberate TV Platform - standard

There are a number of open interface of Liberate VOD Gateway that allow server side integration with various VOD vendors and back-office products. They include:

- Asset Interface
- Session Interface
- Client Interface
- Transaction interface
- Application API/Tool Kits

This specification describes the Asset Interface of the VOD Gateway. An overview of VOD Gateway architecture is also provided. The specifications for other interfaces will be provided in separate documents.

1.2 Acronyms

ADI	Asset Distribution Interface
AMS	Asset Management System
ASI	Asynchronous Serial Internet
ATSC	Advanced Television Systems Committee
BMS	Business Management System
DBDS	Digital Broadband Delivery System
DHCP	Dynamic Host Configuration Protocol
DNCS	Digital Network Control System
DSMCC	Digital Storage Media Command and Control

DVB	Digital Video Broadcasting
ES	Elementary Stream
HFC	Hybrid Fiber Coax
HTML	HyperText Markup Language
HTTP	HyperText Transfer Protocol
IETF	Internet Engineering Task Force
IP	Internet Protocol
LLC	Logical Link Control
LSCP	Lightweight Stream Control Protocol
MAC	Media Access Control
MOD	Movie On Demand
MPEG	Moving Picture Experts Group
NSAP	Network Service Access Point
PAT	Program Association Table
PID	Packet Identifier
PMT	Program Map Table
PSI	Program Specific Information
QAM	Quadrature Amplitude Modulation
QOS	Quality of Service
QPSK	Quadrature Phase Shift Keying
RTSP	Real Time Streaming Protocol
SCTE	Society of Cable Telecommunications Engineers
SI	Service Information
SNAP	Subnetwork Access Protocol
SNMP	Simple Network Management Protocol
SRM	Session Resource Manager
SSP	Session Setup Protocol
STB	Set-top box
TS	Transport Stream
TSID	Transport Stream ID
U-N	User to Network (DSM-CC)
U-U	User to User (DSM-CC)
VOD	Video On Demand
XML	Extensible Markup Language

1.3 *References*

1. ISO/IEC 13818-6. *MPEG-2 Digital Storage Media Command and Control (DSM-CC)*

2. *Real Time Streaming Protocol (RTSP),* Internet Engineering Task Force (IETF), February 2, 1998

3. *Asset Distribution Interface,* Version 2.0, November 1, 2000

4. *Movie on Demand Content Specification,* Version 2.0, July 27, 2000

5. *Session Setup Protocol,* Version 2.1, November 3, 2000

6. *Lightweight Stream Control Protocol,* Version 1.0, June 10, 1999

2.   VOD Gateway Standard Architecture Overview

The Liberate VOD Gateway – Standard provides an end to end platform for Video on Demand applications that allows a uniform application independent of VOD server vendors.

At the client side, the generic software is provided as the extenders for Liberate TV Navigator platform. It provides the following modules:

- Session Signaling: it provides either DSM-CC User-Network signaling based on the SSP (Session Set-up Protocol) or RTSP protocol for VOD session signaling.

- Stream Control: the VOD trick modes (play, pause, FF, FR etc.) are enabled via the Stream Control Protocol. Two versions are supported: DSM-CC based Lightweight Stream Control Protocol (LSCP) or RTSP.

- Client Asset Interface: it provides JavaScript based interfaces for asset metadata query for client VOD application. The asset list can be cached at the STB, retrieved from data carousel, or fetched via HTTP two-way interface through DOCSIS or out-of-band channels.
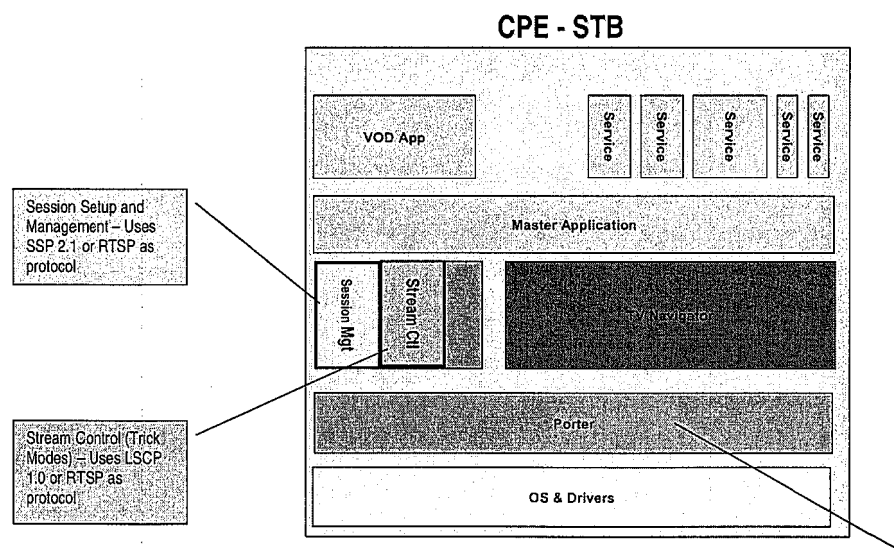

Figure 1. Client Architecture for VOD Gateway Approach

Using the VOD Gateway approach, only a single client (chosen from DSM-CC or RTSP) needs to be provided and maintained no matter which VOD server will be used. In addition, it allows the integration with third party VOD application through Internet standard interfaces such as HTML and JavaScript.
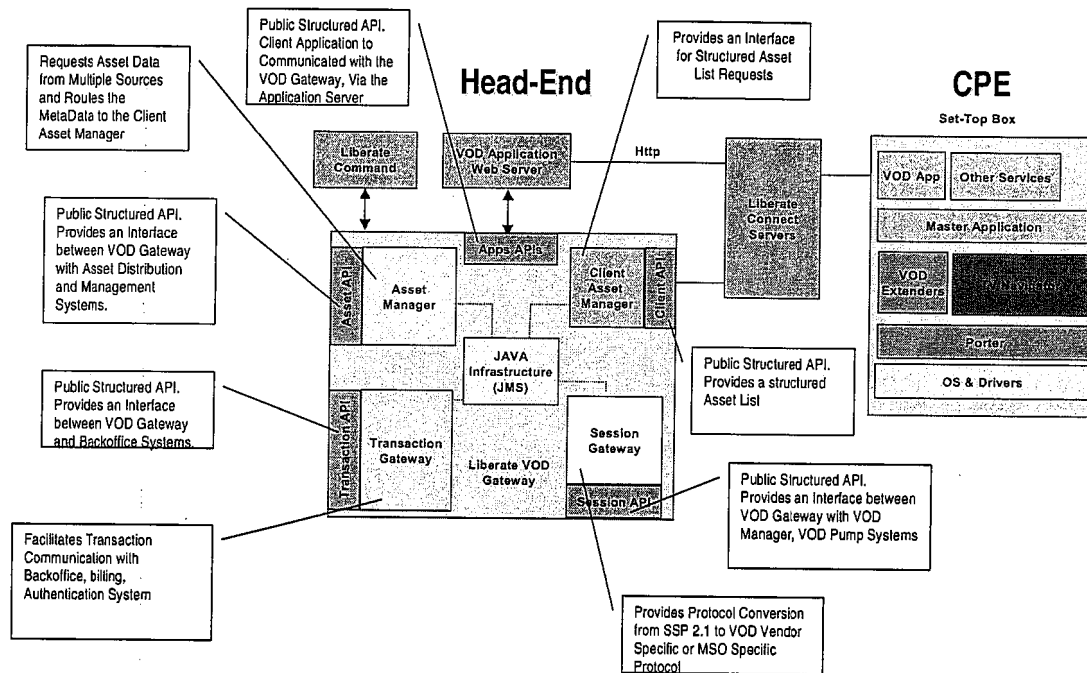
Figure 2. VOD Gateway Server Architecture

The Liberate VOD Gateway server side architecture can be described in the Figure 2. The key modules are described in the following:

- **Asset Manager**: it manages the asset metadata with external sources and routes the metadata to the client asset manager.

- **Client Asset Manager**: it manages the client query of asset list and downloads the asset metadata to the client through data carousel or HTTP.

- **Session Gateway**: it provides the protocol conversion from generic session protocol (SSP 2.1) to VOD vendor specific protocols. Another purpose of session gateway is to provide authentication interfaces for session set-up or tear down.

- **Transaction Gateway**: it provides transaction interaction such as a movie purchase with backoffice and billing system.

- **JAVA infrastructure**: The JAVA Messaging Service (JMS) infrastructure is used for inter-module communication. It is an asynchronous interface and allows each module to scale independently.

The following APIs can be provided for integration between VOD Gateway and external system such as VOD server, Asset Management System (AMS), Business Management System (BMS), third party VOD application, and Liberate VOD client software.

- **Asset Interface API**: interfaces with external Asset Management System or other relevant system for list of VOD assets and its asset metadata.

- **Transaction Interface API**: interfaces with external Business Management System or other relevant system for VOD transaction reporting.

- **Session Interface API**: interfaces with external VOD servers for session signaling protocols from client, including session setup and tear down.

- **Client Interface API**: interfaces with STB VOD client for asset listing. This can be done via data carousel or two-way HTTP access.

- **Application Interface API**: provides APIs (e.g. HTML/JavaScript based) for third party VOD applications.

3.   VOD Gateway Integration (DSM-CC or RTSP)

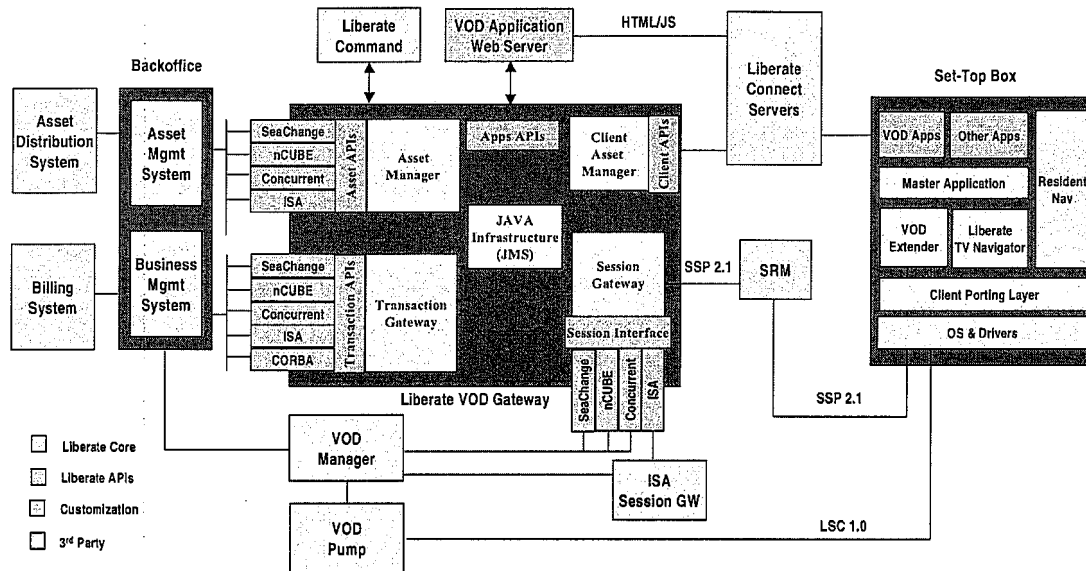## 3.1   DSM-CC Integration

Figure 3. VOD Gateway Integration (DSM-CC)

In the DSM-CC based VOD Gateway Integration, the VOD Gateway can be integrated with multiple VOD server vendors through either vendor specific integration or ISA (Interactive Service Architecture) approach.

The detailed integration architecture is described in the Figure 3. This includes:

- Asset Integration
- Client Integration
- Session Integration
- Transaction Integration
- Application Integration

The basic protocols for session setup and stream control are based on DSM-CC (SSP 2.1 for session signaling, LSCP for stream control).
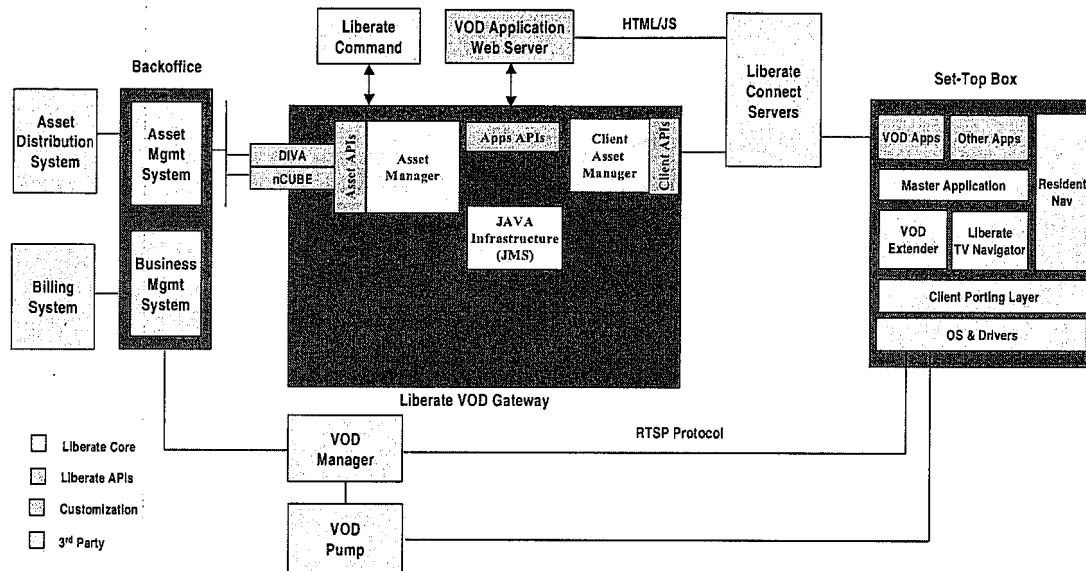
3.2   RTSP Integration

Figure 4. VOD Gateway Integration (RTSP)

In the RTSP based VOD Gateway Integration, the VOD Gateway can be integrated with multiple VOD server vendors through a hybrid approach: asset and client integration via VOD Gateway, standard based RTSP extender integration through VOD manager from specific VOD vendor.

The detailed integration architecture is described in the Figure 4. This includes:

- Asset Integration
- Client Integration
- RTSP signaling integration
- Application Integration

The basic protocols for session setup and stream control are based on RTSP.

EXHIBIT B

Subject: Patent Disclosure (VOD Gateway)
 Date: Thu, 3 May 2001 09:48:20 -0400
 From: "Mao, Weidong" <wmao@liberate.com>
 To: "'allan@jacobson.org'" <allan@jacobson.org>

Allan,

Attached is the draft disclosure for VOD Gateway. More write-up is needed.

- Weidong

📄 LiberateVODGW_Disclosure.doc	**Name:** LiberateVODGW_Disclosure.doc **Type:** WINWORD File (application/msword) **Encoding:** base64

EXHIBIT C

FindArticles > Business Wire > April 11, 2001 > Article > Print friendly

Liberate Technologies Teams With Concurrent Computer Corporation on Integrated Interactive TV and VOD Digital Video Solutions

Business Editors/High-Tech Writers

SAN CARLOS, Calif. & ATLANTA--(BUSINESS WIRE)--April 11, 2001

- Industry Leaders Integrate Technologies and Products -

Liberate Technologies (Nasdaq:LBRT), a leading provider of software for the delivery of interactive television (ITV), and Concurrent Computer Corporation (Nasdaq:CCUR), the leading provider of Video-On-Demand (VOD) solutions, today announced a strategic alliance under which they have combined their technologies into an integrated interactive TV and VOD offering for the growing digital video market. The strategic agreement was reached under the Liberate(R) PopTV(TM) Program, in which Concurrent is a "preferred infrastructure partner," and has the highest level of preference as a VOD supplier.

Integration of Concurrent's MediaHawk(TM) Broadband VOD System and the Liberate TV Platform(TM) software was completed this month, and is immediately available for commercial deployment. The first deployment of the Liberate and Concurrent solution, running on the Scientific-Atlanta Explorer digital set-top box (STB), will be at Cox Communications' San Diego cable system.

"The Concurrent/Liberate alliance is a powerful partnership that teams two industry leaders, and we look forward to deploying the combined services in our San Diego system," said John Hildebrand, vice president, Multimedia Technology, for Cox Communications. "Combining Concurrent's VOD application with the interactive television applications from Liberate creates a very real, competitive differentiator for us, and provides incremental revenue and greater customer satisfaction."

Liberate and Concurrent jointly developed the integrated solution, and will market, sell, and support it to quickly and efficiently enable revenue-producing services for additional broadband system operators.

"Liberate has had tremendous success delivering the software platform that network operators need, and that means offering killer applications like Concurrent's VOD solution to ensure that interactive services are a hit with consumers," said David Limp, executive vice president and chief strategy officer, Liberate Technologies. "Reducing the time and cost of integration, as well as the complexity of managing new services, makes this joint offering a highly compelling business opportunity."

Jack Bryant, Concurrent's president and chief executive officer, said, "By all metrics, Concurrent is the industry leader in deployed VOD solutions and Liberate has enjoyed success as being the platform of choice for interactive television. The combination of the two companies is a very powerful alliance. Concurrent and Liberate deliver complementary technologies and products and share the common mission of enabling broadband system operators to quickly and efficiently enjoy VOD and ITV revenues."

Concurrent and Liberate integrated their products using the Liberate VOD Gateway(TM) technology, which is available immediately. The Liberate VOD Gateway technology provides complete integration of partner VOD solutions on the server side of the architecture, which speeds and simplifies both deployment and management for network operators. Essentially, the VOD Gateway solution allows the Liberate Connect(TM) server software to offer a plug-in environment for partner VOD

applications.

In addition to the Scientific Atlanta set-top platform, Concurrent and Liberate have also agreed to develop, market, sell, and support their solution for the Pace Microsystems STB platform. The combined offering is independent of the network transport infrastructure and can be integrated with either hybrid fiber coax (HFC) or digital subscriber line (DSL) transport networks, as well as IP streaming environments.

The Concurrent MediaHawk Broadband VOD System features the MediaHawk Model 2000 Video Server and MediaHawk BackOffice Business Management System, which provide cable operators all the tools necessary to run their VOD business from end-to-end. The MediaHawk BackOffice Business Management System includes a complete business management system for managing content, subscriber demographic information, transaction and usage analysis, billing, and order fulfillment.

The Liberate TV Platform software enables network operators to deliver applications that integrate the Web's interactivity with the richness of TV-based content. Using open Internet and international broadcast standards, Liberate provides an efficient client (Liberate TV Navigator(TM)) and server (Liberate Connect) platform that combines the best of both the Internet and television into one compelling, interactive medium - enhanced TV. Liberate enables a range of services and applications from interactive advertising and gaming, to chat and email, to enhanced programming.

About PopTV

Liberate's PopTV Program includes more than 1,900 content, device, and infrastructure developers working to give network operators complete interactive television solutions based on Liberate's open standards platform. PopTV provides a fast and cooperative way to develop end-to-end interactive TV solutions, offering benefits that include technical consulting services, certification programs, and joint marketing opportunities. For more information on the Liberate PopTV Program, go to http://partners.liberate.com/poptvprogram.html.

About Liberate Technologies

Liberate Technologies is the leading provider of a complete software platform for delivering Internet-enhanced content and applications to information appliances, such as television set-top boxes and game consoles. Liberate's Internet-based client and server software allows network operators, such as telecommunications companies, cable and satellite television operators and Internet service providers to provide consumers access to network operator-branded applications and services. Headquartered in San Carlos, California, the company has sales offices in the U.S., Canada, Japan, and the U.K.

About Concurrent Computer Corporation

Concurrent Computer Corporation (http://www.ccur.com) is a leading provider of high-performance computer systems, software, and servers. Concurrent Computer Corporation's XSTREME Division is a leading supplier in the emerging digital video server marketplace. This market includes the broadband/cable, corporate training, education, hospitality, and in-flight entertainment industries. Operating worldwide, Concurrent provides sales and support from offices throughout North America, Europe, Asia, and Australia.

Concurrent brings over 30 years of real-time experience to the broadband industry, and in a very short time has become the undisputed leader in broadband VOD. As the newcomer to the industry, Concurrent's VOD performance speaks for itself. Concurrent is uniquely positioned to meet the pent-up demand for interactive television services - movies-on-demand and e-commerce over the television. In a July 2000 report, Forrester Research predicted that by 2005, the overall interactive

television market is expected to generate revenues of more than $48.2 billion. Current VOD and e-commerce trials and launches include: Beijing Fengtai Cable - China; Cox - Phoenix; Cox - San Diego; Horizon.com - Singapore; Shanghai Telecom - China; Time Warner Cable - Oceanic Cable; Time Warner Cable - Tampa Bay; and Comcast - eight undisclosed system deployments.

Note to Editors: For additional company or product information from Concurrent Computer Corporation, please contact Concurrent Computer Corporation, 4375 River Green Parkway, Duluth, GA 30096. Call toll free in the U.S. and Canada at 877/978-7363, fax 678/258-4199. Readers can also access information through the company's Web site at http://www.ccur.com.

Concurrent Computer Corporation is a registered trademark and MediaHawk is a trademark of Concurrent Computer Corporation. Liberate and the Liberate design are registered trademarks of Liberate Technologies. Other product names used in association with these registered trademarks, including Liberate TV Platform, PopTV, Liberate TV Navigator, Liberate VOD Gateway, and Liberate Connect, are trademarks of Liberate. All other products are trademarks or registered trademarks of their respective owners.

Safe Harbor Statement Under the Private Securities Litigation Reform Act of 1995: Information in this release that involves the companies' expectations, beliefs, hopes, plans, intentions or strategies regarding the future are forward-looking statements that involve risks and uncertainties. All forward-looking statements included in this release are based upon information available to the companies as of the date of the release, and the companies assume no obligation to update them. These statements are not guarantees of future performance, and actual results could differ materially from the companies' current expectations. The companies' filings with the Securities and Exchange Commission (SEC) (including Liberate's Form 10Q filed on January 12, 2001) discuss factors that could contribute to such differences and describe other risks of the companies' businesses.